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EXAMINER
VANCHY JR, MICHAEL J

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>08 December 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-13</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-13</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>08 December 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-SB/08)
    Paper No(s)/Mail Date <u>03/19/2007 and 07/05/2005</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

Claim Objections

1.   Claim 7 is objected to because of the following informalities: There is a floating "either" at the end of the claim. Please remove for better clarification of the claim. Appropriate correction is required.

2.   Claim 11 is objected to because of the following informalities: The statement "fingerprint-processing information processing method," the examiner believes that removing one of the "processing" words in the statement will better clarify the claim. Appropriate correction is required.

3.   Claim 12 is objected to because of the following informalities: The statement "fingerprint-processing information processing method characterized by comprising," the examiner believes that removing one of the "processing" words in the statement will better clarify the claim. Appropriate correction is required.

4.   Claim 13 is objected to because of the following informalities: The statement "fingerprint-processing computer-executable program fingerprint-processing program," the examiner believes that removing the last "fingerprint," "processing," and "program" words in the statement will better clarify the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

3.   **Claims 1, 5-9, and 11-13 are rejected under 35 U.S.C. 103(a) as being**

unpatentable over Califano et al., 6,041,133.

The examiner takes into account that even though Califano et al. is silent on taking the area of the triangle, it would be obvious to one of ordinary skill in the art to calculate the area based on the lengths of the sides acquired by Califano et al. (Fig. 4 and col. 5, lines 31-42) using, but not limited to, a formula such as Heron's formula (also called Hero's formula).

Re claim 1, a fingerprint-processing information processing apparatus (Fig. 1A and col. 2, lines 4-9) characterized by comprising: first detection means for detecting from a fingerprint image first feature points which include one of ridge bifurcations and ridge endings of a fingerprint (Fig. 2 and col. 5, lines 22-27); first generation means for generating a triangle which connects three arbitrary points close to one another from among the plurality of first feature points (Fig. 2 and col. 5, lines 31-33); first calculation means for calculating an area and a length of each side of the triangle generated by the first generation means (Fig. 4 and col. 5, lines 31-42); and storage means for storing the area and the length of each side of the triangle calculated by the first calculation means (Fig, 1A, Abstract and col. 1, lines 47-49).

Re claim 5, the information processing apparatus (Fig. 1A and col. 2, lines 4-9) as described in claim 1, further comprising: second detection means for detecting the first feature

points of the fingerprint from the fingerprint image subject to collation (Fig. 2 and col. 5, lines 22-27); second generation means (col. 1, lines 60-66) for generating a triangle for connecting three arbitrary points close to one another from among the plurality of first feature points of the finger's fingerprint image subject to collation (Fig. 2 and col. 5, lines 31-33); second calculation means for calculating an area and a length of each side of the triangle generated by the second generation means (col. 1, lines 60-66) and (Fig. 4 and col. 5, lines 31-42); and comparison means for comparing an area and a length of each side of the triangle stored in the storage means with the area and the length of each side of the triangle of the fingerprint image subject to collation calculated by the second calculation means (Abstract).

Re claim 6, an information processing method (Fig. 1A and col. 2, lines 4-9) characterized by comprising: first detection step of detecting from a fingerprint image first feature points which are either ridge bifurcations and ridge endings of a fingerprint (Fig. 2 and col. 5, lines 22-27); first generation step of generating a triangle which connects three arbitrary points close to one another from among the plurality of first feature points (Fig. 2 and col. 5, lines 31-33); a first calculation step of calculating an area and a length of each side of the triangle generated by the processing of the first generation step (Fig. 4 and col. 5, lines 31-42); and a storage control step of controlling storage of the area and the length of each side of the triangle calculated by the processing of the first calculation step (Fig, 1A, Abstract and col. 1, lines 47-49).

Re claim 7, a computer-readable program recorded on a recording medium (Fig. 1A and col. 3, lines 25-30) characterized by comprising: first detection step of detecting from a fingerprint image first feature points which are one of ridge bifurcations and ridge endings of a fingerprint (Fig. 2 and col. 5, lines 22-27); first generation step of generating a triangle which connects three arbitrary points close to one another from among the plurality of first feature points (Fig. 2 and col. 5, lines 31-33); a first calculation step of calculating an area and a length of each side of the triangle generated by the processing of the first generation step (Fig. 4 and col. 5, lines 31-42); and a storage control step of controlling storage of the area and the length of

each side of the triangle calculated by the processing of the first calculation step (Fig, 1A,

Abstract and col. 1, lines 47-49). either

Re claim 8, a program characterized by causing a computer to execute processing (Fig.

1A and col. 3, lines 25-30) comprising: first detection step of detecting from a fingerprint image

first feature points which are one of ridge bifurcations and ridge endings of a fingerprint (Fig. 2

and col. 5, lines 22-27); first generation step of generating a triangle which connects three

arbitrary points close to one another from among the plurality of first feature points (Fig. 2 and

col. 5, lines 31-33); a first calculation step of calculating an area and a length of each side of the

triangle generated by the processing of the first generation step (Fig. 4 and col. 5, lines 31-42);

and a storage control step of controlling storage of the area and the length of each side of the

triangle calculated by the processing of the first calculation step (Fig, 1A, Abstract and col. 1,

lines 47-49).

Re claim 9, an information processing apparatus (Fig. 1A and col. 2, lines 4-9)

characterized by comprising: first detection means for detecting first feature points which are

either ridge bifurcations and ridge endings of a fingerprint from a fingerprint image subject to

collation (Fig. 2 and col. 5, lines 22-27); first generation means for generating a triangle which

connects three arbitrary points close to one another from among the plurality of first feature

points (Fig. 2 and col. 5, lines 31-33); first calculation means for calculating an area and a length

of each side of the triangle generated by the first generation means (Fig. 4 and col. 5, lines 31-

42); and comparison means for comparing the area and the length of each side of the triangle of

the fingerprint image subject to collation, which are calculated by the first calculation means,

with an area and a length of each side of a triangle of a fingerprint image previously stored

(Abstract).

Re claim 11, a fingerprint-processing information processing method (Fig. 1A)

characterized by comprising: a first detection step of detecting first feature points which are one

of ridge bifurcations and ridge endings of a fingerprint, from a fingerprint image subject to

collation (Fig. 2 and col. 5, lines 22-27); a first generation step of generating a triangle which

connects three arbitrary points close to one another from among the plurality of first feature points (Fig. 2 and col. 5, lines 31-33); a first calculation step of calculating an area and a length of each side of the triangle generated by the processing of the first generation step (Fig. 4 and col. 5, lines 31-42); and a comparison step of comparing the area and the length of each side of the triangle of the fingerprint image subject to collation, which are calculated by the first calculation means, with an area and a length of each side of a triangle of a fingerprint image previously stored (Abstract).

Re claim 12, a recording medium recording a computer-readable program for fingerprint-processing (Fig. 1A and col. 3, lines 25-30), characterized by comprising: fingerprint-processing information processing method characterized by comprising: a first detection step of detecting first feature points which are one of ridge bifurcations and ridge endings of a fingerprint, from a fingerprint image subject to collation (Fig. 2 and col. 5, lines 22-27); a first generation step of generating a triangle which connects three arbitrary points close to one another from among the plurality of first feature points (Fig. 2 and col. 5, lines 31-33); a first calculation step of calculating an area and a length of each side of the triangle generated by the processing of the first generation step (Abstract and col. 1, lines 47-49); and a comparison step of comparing the area and the length of each side of the triangle of the fingerprint image subject to collation, which are calculated by the first calculation means, with an area and a length of each side of a triangle of a fingerprint image previously stored (Abstract).

Re claim 13, a fingerprint-processing computer-executable program fingerprint-processing program (Fig. 1A and col. 3, lines 25-30), characterized by comprising: a first detection step of detecting first feature points which are one of ridge bifurcations and ridge endings of a fingerprint, from a fingerprint image subject to collation (Fig. 2 and col. 5, lines 22-27); a first generation step of generating a triangle which connects three arbitrary points close to one another from among the plurality of first feature points (Fig. 2 and col. 5, lines 31-33); a first calculation step of calculating an area and a length of each side of the triangle generated by the processing of the first generation step (Fig. 4 and col. 5, lines 31-42); and a comparison step of comparing the area and the length of each side of the triangle of the fingerprint image subject to

collation, which are calculated by the first calculation means, with an area and a length of each side of a triangle of a fingerprint image previously stored (Abstract).

4.   Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Califano et al., 6,041,133 and further in view of Fujii et al., 6,233,348 B1.

Regarding claim 2:

Fujii et al. teaches a detection means for detecting a center point, which is a center of the fingerprint image (Fig. 30A-B and col. 37, lines 59-64);

Determining a distance between the center point, detected by the detection means, and a plurality of feature points (Fig. 30A-B, col. 37, line 64 to col. 38 line 10).

However Fujii et al. fails to teach the following limitations that Califano et al. does:

Using feature points to generate a triangle, which connects three arbitrary points close to one another (Fig. 2 and col. 5, lines 31-33).

A sorting means (Abstract).

Califano et al. describes in the Abstract creating "*subsets*" and a "*key is generated that characterizes the fingerprint in the vicinity of the selected subset.*" Even though it is not explicitly stated, these subsets and keys are formed for the purposes of sorting the feature points of different fingerprints. In Figure 9, Califano et al, sorts the sides of each triangle in a predetermined manner, as stated "*the ordering may be accomplished by first selecting the largest of the three sides associated with the triplet.* (col. 9, lines 1-15)" However, Califano et al. is silent on using the distance between the center point and the feature points for means of sorting.

Fujii et al. establishes the feature points and the coordinates, type, and direction of each feature point, including their distances from the center (Fig. 30A-B, col. 37, line 64 to col. 38 line 10). Taking the sorting means for feature points in Califano et al. and using it for the distances found in Fujii et al., would have been obvious to one skilled in the art at the time of the invention. Since Califano et al. already states that it can order distances based on the sides of the triangle it would be obvious to also sort based on distance from the center.

Regarding claim 3:

Califano et al. teaches the three first feature points which constitute the one triangle are, respectively, the first point, the second point and the third point (Fig. 2 and col. 5, lines 31-33).

However Califano et al. fails to teach the following limitations that Fujii et al. does:

Fujii et al. teaches the information processing apparatus as described in claim 1, wherein: the first detection means further detects second feature points which are the other between the ridge bifurcations and the ridge endings, and further including second calculation means for calculating at least one of a distance and a direction between a first point and a fourth point which is the one of the second feature points that is closest to the first point, at least either a distance and a direction between a second point and a fifth point which is the one of the second feature points that is closest to the second point, and at least one of a distance and a direction between a third point and a sixth point which is the one of the second feature points that is closet to the third point (Fig. 30A-B, col. 18, lines 55-58, and col. 37, line 64 to col. 38 line 10); the storage means further stores at least one of the distance and the direction calculated by the second calculation means, between the first point and the fourth point, between the second point and the fifth point, and between the third point and the sixth point (Abstract and col. 1, lines 47-49).

The examiner takes into account that Fujii et al. doesn't specifically use "first, second, third…" points but does take the distance and direction of feature points, which can be the points

specified by the applicant.

Taking the combined teachings of Califano et al. and Fujii et al., it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate more distances between more feature points to increase the accuracy of identifying a positive match between stored fingerprints and the one in question.

Regarding claim 4:

Fujii et al. teaches a detection means for detecting a center point, which is a center of the fingerprint image (Fig. 30A-B and col. 37, lines 59-64);

Determining a distance between the center point, detected by the detection means, and a plurality of feature points (Fig. 30A-B, col. 37, line 64 to col. 38 line 10).

Calculation means calculates at least one of the distance and the direction between the first point and the fourth point, between the second point and the fifth point, and between the third point and the sixth point by using the sorted second feature points (Fig. 30A-B and col. 37, line 64 to col. 38 line 10).

The examiner takes into account that Fujii et al. doesn't specifically use "first, second, third..." points but does take the distance and direction of feature points, which can be the points specified by the applicant.

However Fujii et al. fails to teach the following limitations that Califano et al. does:

A sorting means (Abstract).

Califano et al. describes in the Abstract creating "*subsets*" and a "*key is generated that characterizes the fingerprint in the vicinity of the selected subset.*" Even though it is not

explicitly stated, these subsets and keys are formed for the purposes of sorting the feature points of different fingerprints. In Figure 9, Califano et al, sorts the sides of each triangle in a predetermined manner, as stated *"the ordering may be accomplished by first selecting the largest of the three sides associated with the triplet.* (col. 9, lines 1-15)" However, Califano et al. is silent on using the distance between the center point and the feature points for means of sorting. Fujii et al. establishes the feature points and the coordinates, type, and direction of each feature point, including their distances from the center (Fig. 30A-B, col. 37, line 64 to col. 38 line 10). Taking the sorting means for feature points in Califano et al. and using it for the distances found in Fujii et al., would have been obvious to one skilled in the art at the time of the invention. Since Califano et al. already states that it can order distances based on the sides of the triangle it would be obvious to also sort based on distance from the center.

5.   Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Califano et al., 6,041,133 as applied to claim 9 above, and further in view of Fujii et al., 6,233,348 B1.

Regarding claim 10:

Califano et al. teaches the three first feature points which constitute the one triangle are, respectively, the first point, the second point and the third point.

A comparison means comparing an area and a length of each side of the triangle of the fingerprint image subject to collation, which are calculated by the first calculation means and the second calculation means

However Califano et al. fails to teach the following limitations that Fujii et al. does:

Fujii et al. teaches the information processing apparatus (Fig. 1A and col. 2, lines 4-9) as described in claim 9, wherein: the first detection means further detects second feature points

which are the other one of the ridge bifurcations and the ridge endings; and further includes
second calculation means for calculating at least one of a distance or a direction between a first
point and a fourth point which is the one of the second feature points that is closest to the first
point, at least one of a distance and a direction between a second point and a fifth point which is
the one of the second feature points that is closest to the second point, and at least one of a
distance and a direction between a third point and a sixth point which is the one of the second
feature points that is closest to the third point (Fig. 30A-B, col. 18, lines 55-58, and col. 37, line
64 to col. 38 line 10).

As well as at least one of the distance and the direction of the fourth point relative to the first
point, of the fifth point relative to the second point, and of the sixth point relative to the third
point, with an area and a length of each side of the triangle of the stored fingerprint image as well
as at least one of the distance and the direction of the fourth point relative to the first point, of the
fifth point relative to the second point, and of the sixth point relative to the third point of the
fingerprint image subject to collation (Fig. 30A-B, col. 18, lines 55-58, and col. 37, line 64 to
col. 38 line 10).

The examiner takes into account that Fujii et al. doesn't specifically use "first, second, third..."
points but does take the distance and direction of feature points, which can be the points
specified by the applicant.

Taking the combined teachings of Califano et al. and Fujii et al., it would have been obvious to
one of ordinary skill in the art at the time of the invention to incorporate more distances between
more feature points to increase the accuracy of identifying a positive match between stored
fingerprints and the one in question.

Examiner's Note

The referenced citations made in the rejection(s) above are intended to exemplify

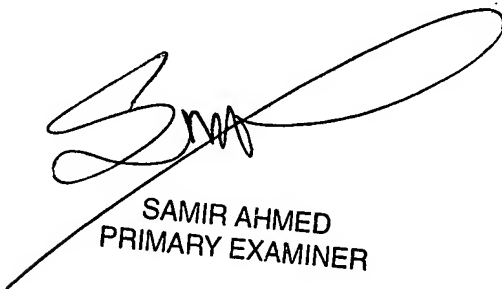areas in the prior art document(s) in which the examiner believed are the most relevant

to the claimed subject matter. However, it is incumbent upon the applicant to analyze the prior art document(s) in its/their entirety since other areas of the document(s) may be relied upon at a later time to substantiate examiner's rationale of record. A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). However, "the prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed...." In re Fulton, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Vanchy Jr. whose telephone number is (571) 270-1193. The examiner can normally be reached on Monday - Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on (571) 272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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